



Cup Positioning System

Written By: Cy Tymony



TOOLS:

- [Magnet \(1\)](#)
- [Pen \(1\)](#)

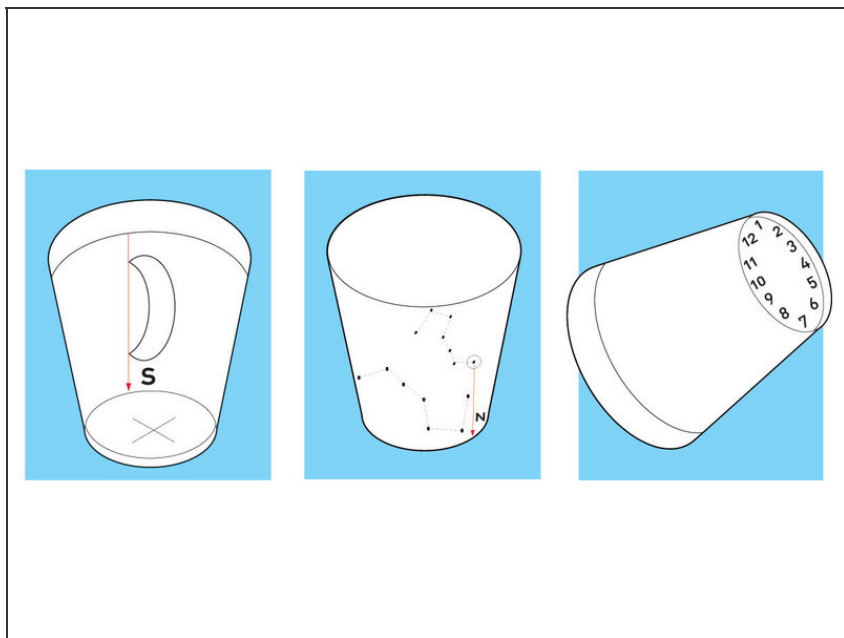


PARTS:

- [Cup \(1\)](#)
- [Paper clip \(1\)](#)
- [Tape \(1\)](#)

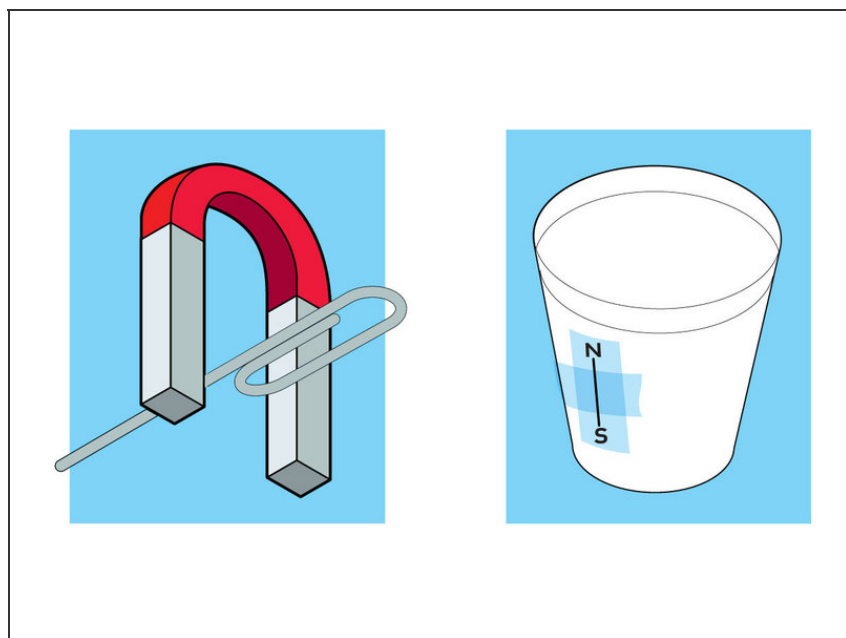
SUMMARY

Not everyone has a GPS (Global Positioning System), but you can easily make a CPS (Cup Positioning System) from any cup and learn the art of orienteering!

Step 1 — Mark the cup.

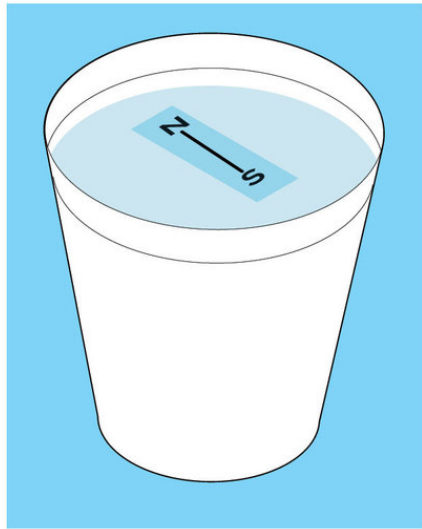
- Draw a crescent moon on one side of the cup. Then draw a downward-pointing arrow that rests against both tips of the moon. Write South at the bottom.
- On the other side, draw the Big Dipper and Little Dipper constellations. These resemble pans with handles. The Big Dipper's rightmost stars point to the Little Dipper's "handle" star, which is Polaris, the North Star. Draw a downward arrow from Polaris and write North at the bottom.
- Turn the cup over and draw the numbers 1 through 12 on its bottom in a clock formation.

Step 2 — Make a compass needle.



- Straighten a staple or small paper clip. To magnetize it, rub it 30 times with a magnet in one direction only.
- Place the staple lengthwise on transparent tape, and fold the tape over so the staple is sealed in the middle. Now float your compass needle on a cup of water and when it comes to rest, write N on the north-pointing end, and S on the other (south-facing) end. Tape it to the side of the cup for safekeeping.

Step 3 — Find your way.



- Your Sneaky CPS device is ready to help you find your directions in several ways, day or night.
- **Sun:** If the sun is visible and you know what time it is, you can easily locate directions. Turn the cup over to reveal the clock numbers. Keeping the cup level, aim the number that represents the current hour at the sun. For example, if it's 3 p.m., aim the number 3 at the sun. Halfway between the position of the sun and the number 12 is the direction south.
- **Moon:** If there's a crescent moon in the sky, imagine an arrow pointing downward that follows the 2 tips of the moon. This points south. This trick also works fairly well with a half or gibbous ($\frac{3}{4}$) moon.
- **Stars:** Position the cup so you can see the Big Dipper and the Little Dipper images on it. Now look up to find them in the night sky. It's easier to locate the Big Dipper first, then follow its rightmost stars that point to the Little Dipper's "handle," the North Star.
- **Compass:** Add water to the cup to transform it into a compass. Float your compass needle on the surface. When it comes to rest it will point north!

This project first appeared in [MAKE Volume 21](#), page 30.

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